**Bio111 Week 6**

Before you come to lab

1) Read about MRSA and why evolution of drug resistance is a medical concern. <http://www.premierinc.com/safety/topics/HAI/HAI-Multidrug-resistant.jsp>

2) Read about slime mold (*Dictyostelium discoideum*) <http://en.wikipedia.org/wiki/Dictyostelium_discoideum>

3) Go to this web site and watch the 3 movies about slime mold. <<http://www.bio.davidson.edu/people/macampbell/111/weekly_Labs/DIcty.html>>

4) Answer each of these four questions in two sentences or less.

A) Why do you want to use a sub-MIC concentration for your evolution experiment? (evolution)

B) Which population of cells will you use for your next experiment? (evolution)

C) What is the emergent property exhibited by *D. discoideum*? (emergent property)

D) What chemical does *D. discoideum* cells use to communicate with other solitary cells? (emergent property)

**Week 6 (Sept 22th)**

As with the other labs we are doing this year, I am not sure how well this will work. Timing is critical for you to see the slime mold cells streaming. Streaming only lasts for about 1 hour, so we cannot miss this narrow window of time. We will have to play the timing by ear once we see where the cells are in their process.

Emergent Properties In Lab

Each group will be provided with one flask of vegetative slime mold cells and a plate with streaming slime mold cells. Depending on the timing, we may start with either #1 or #2.

1)

a) Observe the streaming cells using the dual-headed dissecting scopes. Dr. C. can help you get the lighting and magnification set up.

b) Once you see slugs, take a sewing needle and try to bisect the slug to see if you can produce two slugs from the cells that used to form a single slug. When the cells are in the slug stage, they are only held together by a thin layer of biofilm. Because of this, it is very easy to cut the slugs in half or cause the cells to disaggregate.

* Find a slug you would like to use. Usually the ones that are the most isolated are the easiest to cut and the easiest to keep track of later.
* Use ethanol to sterilize the needle and simply slide the tool straight through the slug and a top layer of agar. The best results come when the slug has a clean horizontal slice through the middle of it.
* Mark this spot by drawing a circle around this general area with a sharpie on the bottom of the plate.
* If you are observant and are patient enough to watch the slugs, you can usually see very small changes in the slug halves. Clear changes are observed within an hour and two slugs form after about 3 hours.
* You can also cut out a piece of agar from another plate and put it on top of the slug to see if it can escape.

2)

a) Using the video as a guide, harvest your slime mold cells. When all the cells are washed off the bottom of the flask, flood the sterile petri dish that contains 6 sterile coverslips and 20 mL of HL5 growth media. Wait about 30 minutes for the cells to adhere.

b) Remove a cover slip and dry off the bottom side of the coverslip while being careful not to touch the side with the cells. Flip the coverslip onto a glass slide so the cells are trapped between the two layers of glass. Put them on your microscope and watch the cells move very slowly. You should be able to see them feed and forage for food.

3) Design an experiment to inhibit cell streaming or slug movement. Write down what chemical you want to use. You might find some ideas here <http://web.uconn.edu/mcbstaff/knecht/Knecht_Lab/Knecht_Lab.html>.

Evolution In Lab

1) Test cells for the first time, or perform a round of natural selection.